THE VETERINARY RECORD

A Weekly Journal for the Profession.

No. 659. FEBRUARY 23, 1901. Vol. XIII.

The Tuberculosis Congress.

The Congress on Tuberculosis to be held in July will undoubtedly be an important event and will afford an opportunity for discussing the disease from all its various aspects. The Congress will be divided into four sections—one, a veterinary section, under the presidency of Sir G. T. Brown, C.B. Tuberculosis among animals is not merely a matter of scientific concern to veterinarians. It is a subject of vital importance to the breeders of pedigree cattle, to the owners of animals used for the production of meat and milk, and to the consumers of animal products which may be contaminated with disease. All the various interests will be represented and no section ought to be more important or more interesting than the veterinary.

Than tuberculosis, there is no disease affecting man and animals on which more scientific light has been thrown by the veterinary branch of medical research. The purely contagious nature of the disease has been established by veterinary workers. The erroneous notions as to the part played by heredity have been corrected by the observations of veterinarians. The value of tuberculin as an aid to diagnosis is still recognised almost alone in veterinary practice.

That only a small proportion of human tuberculosis is derived from diseased animals is doubtless correct, but the fact is not to be accepted as an argument that we may ignore the disease in animals. On the contrary, it is a very strong reason for taking measures to prevent the loss of human life which does occur.

The chief argument which stimulated action against rabies in dogs was the certainty that hydrophobia in man would cease if the disease in dogs could be suppressed. Of course if every tuberculous animal were destroyed to-morrow we should still have tuberculous men. In no series of years did the dog disease cause 20 human deaths per annum. It will not be denied that the extermination of tuberculosis in animals would probably prevent the infection of 2000 men every year—in other words it would save a hundred times more human lives than resulted from the suppression of rabies.

Even if tuberculosis of animals were not communicable to man the economy of its suppression could easily be made manifest. The exportation at high-prices of pedigree stock is now hampered by the necessary protection adopted by foreign and colonial buyers. The meat trade is kept in a state of agitation by the seizure of animals bought from stock-owners as healthy. The losses of dairy farmers are constant and severe.

The coming Congress should assist in bringing about legislation for controlling the disease and at the same time do justice by the different interests affected. Every veterinary society should send delegates and every veterinarian should co-operate to ensure success. Professors Hobday, Bradley, and Woodruff are Secretaries and will afford every information.

MEDIAN NEURECTOMY.

By Henry Gray, M.R.C.V.S.

As I believe I was one of the first practitioners in this country, outside the walls of the Royal Veterinary College, to perform median neurectomy, I think a few observations on my experience of the result of the operation will not be out of place here.

Most of my cases belonged to the better class horse—the carriage horse—a few cart horses and some cabbers. Some cases were operated upon for lameness, from splint and knee-splints persisting after repeated pyro-puncturing, blistering and rest had failed. Others followed, similar treatment failing for thickened tendon coupled with ringbone and sidebone, and the remainder for exostosis of the fetlock joint. In the case of a brown mare that had been lame a long time from ringbone and sidebones, coupled with the consequent thickened tendon, I performed median and external neurectomy. After a months' gentle exercise this animal was put to work and remained perfectly sound for at least three years, then she was sold, not as being useless but to make room for younger and newly purchased horses. Before the operation was decided upon it was a question whether she should be killed as being unfit for further work.

The enlargement round the top of the coronet grew to three times the size after the operation, but after a time it became reduced to about the usual size of ringbones and sidebones.

This mare had to do the roughest labour in a builder and contractor's work of drawing out ballast from excavations and never had any rest from any lameness from the day it was put to work to the day it was sold. For the same firm I performed the operation several times for similar cases, after the usual brutal treatment had failed, and in every one the operation paid for itself by the owner getting his fair share of work out of them before casting or having them destroyed.

As I said above I have operated on carriage horses for splint and knee splint after the usual treatment had failed, and the owners had been without the animal's service, and in every one of those cases I have been successful in my endeavour to quickly render the horses fit for work. Beyond a case developing epilepsy and another intermittent lameness, I have observed nothing unusual. The splint or exostosis grows larger at first, to become gradually absorbed.

This class of animal, I may add after 16 years experience, is the best subject for all kinds of neurectomy, whether low, plantar or median. The cab horse is the worse as he is driven helter skelter, here

there and everywhere, and is therefore most liable to suffer from injuries to the feet, etc.

Like M. Pellerin, my experience is that neuromas after median neurectomy are rare. Perhaps our difference of conclusions from those of Professor Hobday are due to the method of operating, that is, the size of the portion of nerve removed, etc. I have tried suturing the wound and also leaving it without sutures, but find that healing takes place quicker after suturing.

I have not noticed eczema or pruritis after this form of neurectomy as after the plantar, but with median coupled with external plantar I have seen dry sloughing of the hoof, and also giving way of the tendons, but I do not consider it due to the median division alone. I do not think it is our duty to enquire of the owner what he wishes to do with the horse if we perform the operation. This is not our province unless we are asked to do it with the object of deceiving the public.

People who use horses in towns for commercial purposes can't afford to keep a horse in the stable indefinitely lame, they want them for work, and the sooner they are at work the better it will pay them; if not they prefer to sell them at a loss or have them destroyed.

Many practical horsekeepers don't care a jot whether the operation is a scientific one or not, but if in the majority of instances they can get a season's work out of an animal they prefer to have it done rather than lose the services of the animal. No doubt the majority of cases would get well without the operation if a long rest could be given, but in London especially, time, as well as room, grub, etc., is money with the carman, jobmaster, or cab-proprietor.

In conclusion, I think the profession in this country should be grateful to Prof. Hobday for his endeavours to advance veterinary surgery, especially in those branches that have been utterly ignored up to a few years ago in the teaching establishments. If he has advanced nothing new still the credit is his all the same for disseminating such knowledge. If horses are unnerved sometimes in mistaken diagnosis by a young man it is excusable, for not many of us in the exuberance of our youth are free from errors, but we all become wiser as we grow older, and even the most, or considered most, experienced are liable to trip now and again if we venture, but we had better trip in trying to advance than do the same by standing still. There is an old saying—"nothing venture nothing have."

Let me add that as far back as 1856 W. T. Stanley wrote to *The Veterinarian*, vol. 29, pp. 377-380, on "Neurotomy," and his conclusions cannot be surpassed even now. He mentions popliteal (posterior tibial) neurotomy in cases of hock lameness, and gives Professor Spooner the credit of recommending him to perform the operation. It is mentioned in W. C. Spooner's edition (1842) of White's Farriery that Prof. Spooner, as well as Mr. Stanley, performed successfully excision of the nerves a few inches above the hock, on the inside only for incurable cases of bone spavin. But even at a still earlier date a letter from Mr. W. T. Stanley on the subject of posterior tibial neurotomy was read at the meeting of the Veterinary Medical Association held on March 9th, 1841.—(Abstract from Proceedings Veterinary Medical Association, p. 245, 1841).

PARALYSIS OF THE TAIL, BLADDER AND RECTUM.

I am very much interested in the case recorded by Mr. Pauer in *The Veterinary Record* of Feb. 9th, especially as the horse was a grey one.

I have seen similar cases occurring in grey horses from melanotic growths within the vertebral canal, causing slow compression of the spinal cord. Also I have seen horses of various colours affected with ankylosis of the dorso-lumbar or lumbar vertebræ having a tendency to cross the hind feet and swinging or swaying of the hinder parts, and a difficulty in turning during progression—become similarly paralysed in the rectum, sometimes or not associated with paralysis of the bladder and tail, if they had an attack of influenza, strangles, catarrh, etc., but would recover in this respect after the temporary affection disappeared. Again, some cases of fracture of the lumbar or sacral vertebræ are accompanied with these symptoms. Ascending neuritis of the cauda-equina, any chronic lesion of the dorso-lumbar, or lumbar portion of the spinal cord and its meninges such as softening, hydrorachitis, tumours or intra-medullary hæmorrhage are so many causes. However in many cases no lesions are discernable by the naked eye.

IBID.

PARALYSIS OF THE TAIL AND RECTUM.

I have been interested in reading the case of paralysis of the tail, rectum and bladder, reported by Mr. Pauer in your recent issue, as it coincides very closely with a case which I attended some time ago. I intended at the time to write you a short account of it, but that intention went (with others) to swell the already plentiful supply of paving material in the lower regions.

I was called one evening to a horse, the property of a laundryman who had bought him from among the cast horses of, I think, the L.G.O.C. He was a bay gelding, seven years old, in good hard-working condition. On my arrival I found that he had been suffering from slight colicky pains all day with inability to void fæces, and his owner had at last got alarmed at the appearance of the anus which was distended to a degree greater than I should have thought possible. On raising his tail to investigate the state of affairs I found that he appeared to have no control over its movements and the horsekeeper informed me that he had noticed for some time that the animal "had no use of his tail." He did not lift his tail when performing the act of defæcation, but it was pushed to one side by the fæces in their exit.

I performed the operation elegantly styled "back-raking," found the rectum enormously distended, and removed enough fæces to more than fill two ordinary

buckets. The abdominal pain subsided in the usual way, but at intervals for a day or two the fæces had to be artificially removed from the rectum and from that time onward whenever the horse had a day's rest the fæces had again to be removed by hand although while at work the rectum appeared to perform its functions normally.

In this case there was no incontinence of urine and no wasting of the muscles of the quarters was observed, as in the case reported by Mr Pauer, but, on enquiry, I found that though the horse could back an empty van he could not do so when the van was loaded.

I attempted treatment by the administration of nux vomica, but as the animal was of little value, it was soon discontinued and was of no avail. I know however, that in spite of his condition, the horse continued to work for about a year when he was sold and I lost sight of him.

W. H. Williamson, M.R.C.V.S.

DYSENTERY.

By E. Wallis Hoare, F.R.C.V.S., Cork.

Subject.—An aged weight-carrying hunter.

Previous History.—Healthy.

Clinical History.—On the morning of December 20th, the animal showed symptoms of abdominal pain such as rolling, pawing, etc. He then sweated profusely, and was walked about by the owner's orders. On attendance I found the patient showing dull persistent pain, evidenced by constant pawing and restlessness. The surface of the body and extremities were cold, the pulse weak in character, temperature 102°, respirations greatly accelerated, no tympanites, the abdomen "drawn up"; he lay down occasionally, but preferred the standing posture. At intervals he purged freely, the excreta being thin, very fœtid, and containing a large amount of dark-coloured blood, and expelled with considerable force. Flakes of mucus were also present. A dose of chlorodyne and spts. æth. nit. was at once administered, and the animal was warmly clothed. On enquiry into the diet I found that carrots had been allowed that morning as was usual when the horse was not at work, the oats and hay showed nothing of a deleterious nature.

In two hours there was slight improvement as the pain had decreased, but the coldness of the surface and extremities, and the purging still continued. Four glasses of port wine, four glasses of brandy and ʒi. ext. Belladonna, were then given, also an enema of hot water. After a short time there was marked improvement, the surface and extremities becoming warmer and the pain less. A mixture was prescribed containing sodii bicarb, ext. belladonna, vini ipecac, and small doses of tr. opii. to be given every four hours in two glasses of brandy, four glasses of port, and a pint of starch gruel while the purging continued. No solid food was allowed, simply oatmeal and starch gruel and milk with lime water.

Next day I found the patient much improved, he still "pawed" at intervals, and the purging continued, the excreta consisting of semi-digested oats, blood-stained, and with an abominable odour. He refused all solid food, but would eat oats or hay if allowed.

I prescribed ℥xx. Ac. carbolic pur., three times a day in addition to the former mixture, and ordered three eggs beaten up to be given t. i. d.

Next day the animal was reported better, the purging less and little blood was to be seen in the excreta. I discontinued the tr. opii., from the mixture. The fluid foods were refused except in very small amounts, and the owner was getting anxious as to the patient's appetite; however, I insisted on no solid food being allowed.

Next day the medicines were discontinued as a favourable report was received, and at the end of the week small quantities of steamed oats were allowed as the patient was convalescent.

Remarks.—In my experience dysentery is not of frequent occurrence in the horse. The striking features observed are the marked constitutional disturbance, the slow persistent pain evidenced by the constant pawing, the depressed appearance of the countenance, the excreta mingled with dark-coloured blood and flakes of mucus and possessing an unbearable odour.

SEPTIC PLEURITIS OF THE DOG DUE TO "SPIROPTERA SANGUINOLENTA."

The subject was an Irish terrier dog sent to me by a lady to make a post-mortem upon.

The history of the case was rather unsatisfactory, but the owner said that for some days the dog had taken very little food, and, that he had partaken of, he had vomited. He was very dull and listless and extremely thirsty. No rabid symptoms were noticed such as have been said to occur in these cases. The carcase was very emaciated. The autopsy revealed a double pleuritis with a large quantity of serofibrinous and purulent fluid in the chest, and it was very foul. The inferior two-thirds of both lungs were collapsed. The non-collapsed portions of the lungs were congested, but there was no pneumonia shewing that the pleurisy was primary. Search revealed two verminous tumours of the œsophagus situated in its thoracic portion and these had ruptured, One was as large as a walnut while the other was somewhat smaller. In the tumours were found worms coiled up in cavities or partitions of the tumours and they answered to the description found in Neuman of "spiroptera sanguinolenta."

The cause of the pleuritis was evidently due to the passage of organisms through the opening of the tumours into the chest. A careful search failed to reveal any worms or tumours in the stomach, which was empty.

G. K. Walker.

India, Jan. 30th.

RUPTURED SPLEEN.

By Harry Lukes, M.R.C.V.S., Springfield, Mass.

May 7th, called at 6.30 a.m. to C. E. Mansfield's.

Subject.—Grey gelding, 14 years old, 16 hands, 1400 lbs., very fat.

History.—Owner had noticed horse slightly off during early morning trip.

Symptoms.—Horse lying down resting on sternum, eating hay. On being asked to rise he did so, but was immediately attacked with severe asphyxiation so that he fell down in two minutes, but immediately rose again, when the asphyxiation was renewed, but after a few minutes passed off and horse stood quiet. No pulse perceptible at the jaw; respiration normal, temperature 101-2/5. On listening to chest could hear heart beat very faintly; the visible mucous membrane very pale (extremely so).

Diagnosis.—A rupture of some internal organ with hæmorrhage.

Prognosis.—Death.

Treatment.—Gave strych. sulpht. gr. ss., with no result on heart. Death ensued in 25 minutes after my arrival, or about one hour and 15 minutes after first noticed sick.

Autopsy.—On opening the abdomen the blood rushed out as if a hogshead had been overturned, the abdomen being filled with it. Found the heart enlarged, weighing 10½ lbs. with fatty degeneration. Could denote nothing else until I came to the spleen, which was of an enormous size. Found on internal face a rupture 14 inches long and three inches wide; spleen weighed 9¾ lbs.; the spleen measured 31½ inches long, 15¾ inches wide, and was from 2 to 4½ inches thick.

Question.—What caused the rupture?

PURULENT METRITIS, OVARO-HYSTERECTOMY.

By F. H. Ridler and F. Hobday,
Veterinary Infirmary, Kensington, W.

The patient was a boarhound bitch, eight years old, and in poor condition. She had been suffering for about eighteen months from a fœtid vaginal discharge. Sometimes it was worse than at others, and occasionally a week would pass without anything being noticed. The animal was known to have had pups about five years ago, but she had not been warded since.

Astringent and antiseptic injections were applied with various patterns of syringe, and a tube was introduced into the uterus itself but the results, although affording temporary improvement, were not permanent or satisfactory. At last the owner was persuaded to consent to an operation, and on the 16th of December ovaro-hysterectomy was performed under chloroform with strict attention to antiseptic measures.

Beyond the removal of the external sutures on the 26th of December the wound received no further attention, in fact so little notice did the bitch take of the operation that she managed to escape from the Infirmary on the 19th and to race home, a distance of about a mile.

During the first fortnight in January there was still a little discharge from the remaining portion of the vagina, but the thorough application of an astringent swab soon cured this, and at the present time the animal is perfectly well and recovering in condition. The left ovary was fully four times the normal size and cystic, the right one about twice normal size. Each horn of the uterus contained a large quantity of pus at its extreme end, quite out of the way of the nozzles of the syringes we had been using.

SCROTAL HERNIA COMPLICATED BY FLATULENCY.

Subject.—Grey Arab horse, aged 14 years.

History.—Taken with colic at 5 p.m. while in carriage, noticed when stopping after ascending a sharp hill. Brought to hospital at 6.30 p.m.

Symptoms.—Colic pains, much distension of abdomen, small hernia right side of scrotum. Pulse 64 wiry, temp. 102·4.

Treatment.—7 p.m. Gave ol. lini. Oj., tr. opii ʒij, Enema warm water and soap not retained, emptied rectum by hand and cast, reduced hernia and prepared to get horse up, hernia reappeared, again reduced and kept horse recumbent. Hernia reappeared at 9.15 p.m. on renewal of colic pains; abdomen more distended, punctured colon with small trochar and canula and so reduced pressure; reduced hernia and applied bandage ligature to scrotum. Gave tr. opii. ʒii. and kept horse down. No more colic, and quiet night.

After treatment, low diet, and walking exercise for a week. Iodoform and amyl applied daily to wound.

8th day: Discharged and resumed work. Under observation for two years and no return of hernia, then sold and lost sight of.

The Doctor Sahib.

ABSTRACTS FROM FOREIGN JOURNALS.

Vaginal Injection of a Solution of Sodium Bi-Carbonate to Facilitate the Fecundation of Mares.

M. Trouette, veterinary surgeon at Delys, reports that Grabensac, director of the stud at Hanover, considering that sterility of mares is due to acidity of their vaginal mucus, systematically injects a solution of five grammes of bicarbonate of sodium in a litre of warm water into the vagina just before being covered in those mares that have been previously fruitlessly served. Instead of a syringe he used an irrigator having a small bulbous nozzle piece pierced by several holes so that the solution more easily washes the whole of the vaginal mucous membrane.

His experiments in 1897, carried out on 436 unim-

pregnated mares gave the following results: 277 conceived, 157 remained sterile, and 14 were lost sight of. Old brood mares which had not borne any foals for several years became pregnant, and a mare of eight years, covered three years successively without success, gave birth to a splendid foal.—(*Rev. méd. de l'Afrique du Nord*).

H. G.

On the Pathogenesis and Therapy of Milk Fever.
By C. Hemprich, of Parey, Veterinary Surgeon.

It has often happened in the history of medicine that the specific therapy of an illness has preceded its etiological explanation. The mere empiric or dabbler will of course feel satisfied in such cases with a progressive regressive development of thing,s and seek to put off and satisfy the importunate with a simple definition. True science, however, seeks to learn the truth without consideration of praise, acknowledgement, or profit, and strives after knowledge and, indeed, has pleasure only in knowledge itself. With this feeling uppermost we can never be satisfied with the present existing difference between the etiology and therapy of milk fever, but it is our duty to furnish material for the unravelling of this difficulty.

With the experience of the last three years before us we can safely say that Schmidt of Kolding with his infusion of potassium iodide into the udder of milk fever stricken cows has got hold of the right therapy, and has given us against this serious complaint a specific of the first rank which can hardly be superseded by a better one. But a better etiological explanation of this illness is needed. The complex symptoms arising in the illness seldom fit in with our ideas as to its cause. With all the present known theories we frequently find reason to differ.

According to Schmidt, of Kolding, the illness is caused by a toxin or ptomaine which is formed under special conditions of milk production, which active toxin gaining access to the blood stream produces a poisoning bringing about the severe affection with which we are acquainted. This hypothesis assumes a peculiar deterioration in the milk gland, an affection of this organ whereby toxin arises. And at first sight it would appear so. For the supply of milk decreases more or less on the first symptoms of illness manifested by the animal. Closer examination, however, throws doubt on this belief. Whilst in many cases we find the udder greatly swollen and œdematous, in other cases we have found it quite normal and with no pronounced or noticeable changes in the consistence of the gland.

Also, experiments on white mice have failed to demonstrate any active toxic substance in the milk, for I am of opinion that any serious affection of the milk gland would be communicated to the milk itself. In order to escape this contradiction we must give up the idea of the formation of a toxin in the udder and stick to the belief that the milk gland is perfectly normal until the whole system becomes affected by the illness. We come nearer to the cause if we make clear the following ideas. The animal organism depends for its cohesion and co-ordination on a self-acting mechanism in which a living chemismus plays a part. Raw materials given are changed in the animal body in many ways, and into many different constituents. But we know that no right manufacture goes on without the formation of waste products; above all it follows that waste products thrown out in a natural state of things must be diverted elsewhere.

Milk is without doubt the most important manufactured production of the animal organism. Thus in milk production waste products (radical) must be formed which must be separated and cast out by some organ of the animal body, or chemically changed so that they cannot accumulate and exert their injurious effect on the blood. But we must question how these waste products accumulate in the blood in milk production or strictly which organ can exert an effect naturally antagonistic to milk production.

On closer comparison of the functions of individual organs which the reader schooled in physiology may refer to in detail, the liver will be found to be the organ which can offer a state naturally antagonistic to the production of milk. For this organ is not only secretory but also extremely powerful synthetically, for it converts simple materials into those of a much higher chemical grade. One could in this way easily incline to the view that the accumulation of the radical arose through an affection of this organ so that the manufacture of the milk radical, as we might call it, might not be possible. I do not agree with this view, however, at least not in the great majority of cases. It appears to me much more likely that the accumulation of the radical in the blood is brought about because the liver shortly before, and for sometime after the illness, is not capable of perfectly converting and dealing with the waste products during the time of rapidly arising lactation, since the liver in consequence of long indulgence (during the drying time) is not accustomed to a great burden of work. We have in milk fever an intoxication in the best sense of the word without, however, needing to look about for the special formation of a toxin.—(Ex. *Berliner Thierärzt Woch.*

G. M.

(*To be continued*).

THE HISTOLOGY OF THE BLOOD *

By Prof. A. E. Mettam.

PART I.

A discussion upon the blood to be limited to a single paper would be very incomplete, so with your permission I wish at this moment merely to content myself with a general view of the histology of the normal blood, reserving the pathological aspects to be dealt with later. Incidentally I desire to deal with the characteristics of the corpuscles, and the bearings that recent researches have upon the blood in relation to immunity, and, mayhap, the production of various kinds of sera.

Though one is very familiar with blood as regards its general appearance and with many of its characteristics

* A paper read before the National Veterinary Association of Ireland, Dublin, Feb. 7.)

outside the body, and though it appears a simple enough process indeed to examine blood in films, still, the technique, the means to be adopted to adequately and satisfactorily examine the condition of the blood at any particular moment in health or disease, is by no means so easy as it appears to be. Fluid blood when examined under the microscope in thin films only gives us a very imperfect picture of what really is to be found on careful fixing and staining, and save for the purpose of estimating the number of corpuscles, coloured and colourless, and noting the formation of rouleaux in the former, and the rapidity or otherwise of the formation of fibrin, this method is now obsolete. For a true blood picture to be obtained the blood must be fixed, and it must be stained as we would stain a section obtained by the microtome ; the only difference is that the thin blood film is fixed upon a coverglass and the coverglass is treated as a section. Further, rapidity of treatment both in making the film and in fixing it before structural changes or the formation of fibrin has commenced is necessary, and care must be exercised lest we distort, rupture or otherwise alter the appearance of the very delicate bodies with which we have to deal. According to the care exercised, rapidity of manipulation and other factors the success of the preparation depends. That it will in the future become necessary for the clinician more and more to note the characters of the blood of his patient I trust I may be able to show before the paper is completed.

Red Blood Corpuscles.

The blood is a tissue—a fluid matrix, the blood plasm, containing cells of various kinds which we collectively term the blood corpuscles. The corpuscles are generally termed red and white, or coloured and colourless, according to the presence or absence of hæmoglobin. Hæmoglobin is the oxygen carrier to the tissue, and it forms a large proportion of the residue of the red corpuscle when dried. The colouring matter of the blood is a very necessary element indeed, for according to its greater or less proportion—to the absolute diminution of the red corpuscles or to the amount of hæmoglobin naturally contained therein—we have the different conditions of anæmia. For anæmia does not necessarily mean a decrease in the number of red corpuscles, as after a severe blood-letting, though that is one form, and fortunately an evanescent form in the majority of cases, but the number of corpuscles may be normal, or not much below normal, and yet the normal amount of hæmoglobin not be present. In other cases the number of coloured corpuscles is absolutely diminished and the proportion of coloured to colourless is very seriously altered, and as a consequence the colour of the blood as a whole is so changed that it may be merely pink instead of the rich scarlet customary to observe when blood is exposed to the oxygen of the air. The red blood corpuscle, or erythrocyte as now termed, is according to the well-known definition a bi-concave circular disc, that is it is dimpled at its centre on both surfaces. It is without a nucleus, and owing to the absence of the nucleus the question arose, and for a very long time was debated, as to whether the corpuscle was a cell or not. It is thought that the more or less transparent centre of the corpuscle contains the remains of the nucleus. Now I think we may agree that the erythrocyte is a cell which has lost its nucleus and that the corpuscle without the nucleus is the erythrocyte that has become specialised for a particular function, has already completed a great portion of its life's cycle, and that when fully elaborated passes a brief though brilliant career as an oxygen carrier, then decays, and eventually is devoured by the scavengers of the body.

The red corpuscles of all mammals under ordinary conditions are bi-concave and circular, the camel tribe alone forms an exception where the corpuscles are oval. In the early fœtal condition the red corpuscles are nucleated and nucleated red corpuscles may be found circulating in the blood stream even at the time of birth.

After severe hæmorrhage nucleated red corpuscles may appear in the blood stream but these are merely erythroblasts that have been hurried out from the blood-producing centres in order to take the place of the red corpuscles lost. For putting aside shock as a cause of death from hæmorrhage, asphyxia or absolute oxygen starvation due to loss of the oxygen carriers also hastens dissolution. In vertebrate animals lower than mammals the red corpuscles are oval and are nucleated.

The chief source of the red corpuscle in the body after birth is the bone marrow, that is the red marrow The red marrow is extremely abundant during youth, It declines somewhat as adultism is reached, becoming more or less fatty; in old age, however, the fat is absorbed and the marrow again becomes red. There appears to be a kind of oscillation in the quantity of red marrow, even at a particular period of life, and it is salutary that such is the case—for the marrow to be ever ready to resume the function it has temporarily laid aside. During fœtal life the liver is an important blood-producing organ, and so is the spleen, but after birth, indeed during the later period of intra-uterine life, this function in the above-mentioned organ more or less disappears.

The red corpuscle maintains in the particular species of animal under examination a remarkable constancy as regards size : occasionally a larger or smaller corpuscle may be observed, but ordinarily such corpuscles are not numerous. Amongst animals that we may claim as patients of the veterinarian the elephant has the largest corpuscle (1-2740), the goat the smallest (1-6400), the cat's corpuscle (1-4000) is smaller than a dog's (1-3300); though larger than a horse's (1-4600) which again is larger than that of the sheep (1-5000). The largest terrestial mammal happens to have the largest corpuscle, but it is a mere coincidence ; the size of the animal does not influence the size of the corpuscle as the measurements given above will show.

About the structure of the red corpuscle much controversy has raged, but I think that since we are not able to reveal a stroma by the most approved methods of technique, and from the appearances noted in the reaction of the corpuscle to solvents, we are forced to conclude that it is nothing but a bag of jelly-like protoplasm which is saturated with hæmoglobin. It is believed that a thin pellicle of fat covers the corpuscle, from the peculiar behaviour in the formation of rouleaux and from the reaction observed when osmic acid, or fixing fluids containing osmic acid are employed. Outside the body the blood corpuscle changes in appearance and in shape, being influenced by the character and density of the medium, and with these changes we need do no more than mention them. Corpuscles are said to be crenate if irregular ; like a horse chestnut if carrying many processes ; the colouring matter may be dissolved out and it is this solution of the colouring matter and liberation that produces the peculiar coloration of meat that has been frozen and then thawed. These are interesting, but not for us to study now.

The red corpuscles may be altered vastly in shape in various forms of anæmia taking on most remarkable bizarre forms. This is the condition known as poikilocytosis, and frequently the vessel walls are altered as well —a nutritional change, doubtless—and hæmorrhages are not uncommon. An increase in the number of red cells is known as polycythæmia ; a diminution as oligocythæmia ; but as we have already mentioned the quantity of hæmoglobin present is the main factor in the red blood corpuscles. In investigations made upon the blood, eosin or other acid dye stains the hæmoglobin present in the cell and we are able to make a very fair estimate of the amount present—normal or subnormal—by the reaction observed to the dye employed. Red blood corpus-

cles poor in hæmoglobin stain faintly, or even show a tendency to stain with a basic dye, in contrast to the bright red as evinced by corpuscles containing the normal quota of hæmoglobin when stained with eosin.

White Blood Corpuscles.

We must now turn our attention to the white blood corpuscles, and I think I may promise that many will be surprised to learn how varied are the white corpuscles found in the normal blood. Others again appear in certain pathological conditions and are valuable as indicating the probable seat of the mischief, but just now I desire to mention only the corpuscles which we may observe in films of normal blood. Not so long ago we were content to describe the white blood corpuscles as finely or coarsely granular, indeed to place the corpuscle in one of two groups according to the granules it contained. Now, however, though we must note the granules and the reaction of the granules to the several reagents employed, we take into consideration the character of the nucleus, its shape, its size relative to entire cell and amount of protoplasm, its affinity or not for colouring matter. We shall see that the nucleus of the white corpuscle varies considerably in shape; that sometimes the nucleus dominates the whole cell, and is large relative to the amount of protoplasm around it; that sometimes it stains deeply, at other times very faintly indeed; that at one time its structure can be fairly well made out, at another time only with difficulty; some nuclei stain readily, others only after special treatment. In this way we are able more or less precisely to place the corpuscles in groups according to their characteristics, and what is more are able to determine their place of origin in the body. Ehrlich, who has made a special study of the blood, divides the leucocytes or white blood corpuscles into the following groups:

The lymphocytes.—These are the smallest of the white blood corpuscles, and have relatively a large nucleus and only a very small amount of protoplasm which surrounds the nucleus as a shell. A large lymphocyte is also to be observed, this probably is the fully developed condition of the first variety; it is known as the hyalin variety, and in size is two or three times the size of the first, which only equals that of a red corpuscle. The place of origin of the lymphocyte appears to be in the lymphatic glands and lymphoid tissue of the body generally. An increase in the number of the lymphocytes constitutes a "lymphocytosis" or "lymphæmia."

Large mononuclear leucocytes.—In size equal to the large lymphocyte, with a large nucleus situated excentrically; often the nucleus is kidney-shaped and stains faintly. The protoplasm is abundant and without granules. Its home is apparently in the bone marrow.

Transitional forms.—It is said these large mononuclear leucocytes give rise to "the transitional forms," a third variety. The change is exhibited in the nucleus, which is deeply indented, and granules which take on a neutral tint appear in the protoplasm.

Polynuclear leucocytes.—A fourth variety, and in normal blood by far the most common, are the "polynuclear leucocytes" or the leucocytes with polymorphous nuclei. The nucleus of this variety is peculiar, elongated and sausage-like, curved, it may be, in two or three directions, and taking on the appearance of "S, Y, E or Z." This nucleus may break up into three or four small nuclei. This cell is frequently found in exudations. The nucleus stains deeply, the protoplasm usually shows a preference for the diffuse acid dyes. They are amæboid and go to form the pus corpuscles.

The eosinophil cell.—A fifth variety is the eosinophil cell, and this cell is developed to an extraordinary degree in the equine blood. Many years ago Semmer, of St. Petersburg, a name we all know well in veterinary literature, noticed the enormous size of these corpuscles and more especially the granules included within the protoplasm. He even declared that the granules were elementary red blood corpuscles, considering the cell containing them as a kind of brood cell. Further he found that the granules were rich in hæmoglobin. I myself have seen granules free in the blood of the horse which are not the blood platelets or hæmatoblasts, so-called, but I am confident are the granules set free from these coarsely granular eosinophilous corpuscles. I have also seen these granules free in the capillaries in sections of tissues. The nucleus of this cell is like to that of the cell with the polymorphous leucocyte, though in most instances it is hid from view by the large eosinophilous granules. I have no doubt that this corpuscle is amœboid for I have seen this corpuscle migrating through the wall of a capillary. These cells are also found in exudations and in abscesses, and with the former are undoubtedly formed in the red marrow. (Since writing I have noticed these corpuscles in the hæmolymph glands.)

Mast Cell.—Lastly, as a constituent of the normal blood there is the mast cell, which in reaction is basophil. The granules within it stain with the basic dyes, and they are somewhat irregularly distributed through the protoplasm. The staining power of the nucleus is feeble; in some preparations it remains unstained and requires special treatment. Ordinarily they are few in number in the blood, but in medullary leukæmia they become more numerous, and when this condition holds their presence is of more value for diagnostic purposes than the eosinophilous cells.

As I have already mentioned, the corpuscles which I desire to bring to your notice are those found in normal blood, but there are others which appear abnormally in disease or in severe anæmia, and these we may have an opportunity of discussing on another occasion.

I think I have said sufficient to prove to you that the lencocytes, as we commonly term collectively the colourless corpuscles, are of various kinds. Before looking for their origin we must not omit to refer to other elements of the blood—the blood platelets or hæmatoblasts and what is sometimes termed "blood dust."

The blood platelets or hæmatoblasts are very minute, much less in size than the red blood corpuscles; they are very unstable and stain usually diffusely with basic dyes. They have thus a different reaction to the red blood corpuscles, the hæmoglobin of which prefers acid dyes; still, these platelets were considered as the forerunners of the red corpuscles, though save among a certain section of hæmatologists this opinion is now given up. "Recent work is tending to show that they may be derived from the residue of nuclear matter left in the adult erythrocyte."—(*Milroy*). It appears to be the case, however, that the blood platelets influence the formation of fibrin, and the fibrin filaments have been observed to start from an accumulation of these blood platelets. They are also common in thrombi.

Blood dust, or granular bodies, also present in normal as well as pathological blood, are derived in all probability from the granules of the leucocytes, or from fragmentation of these latter. Some time ago I showed the probability of the origin of certain granules in the horse's blood from the eosinophilous corpuscles, and the similarity in reaction between these free granules and the granules contained in the cell.

Origin of the Formed Elements of the Blood.

The lymphocytes, both small and large, seem to arise in the lymphatic glands and to reach the blood stream by way of the lymph current. The lymphocytes are quite similar to the cells found in the lymphatic glands, and occasionally a lymphocytosis has been observed and found to be associated with an increase in the size of lymphatic glands and a proliferation of lymphoid tissue generally. Wherever, indeed, an irritation of lymphoid tissue occurs there is a proliferation of the cellular

elements. During digestion the number of lymphocytes in the blood appears to increase and these, it is probable, come from the lymphoid tissue in the walls of the intestine. It has also been observed that an increase of lymphocytes in the blood follows the injection of tuberculin in tuberculous subjects, and in Ehrlich's opinion this was due to a specific reaction on the part of diseased glands. Waldstein, quoted by Ehrlich, says that he caused an increase of lymphocytes by the injection of pilocarpine. In the majority of instances it is thought that an increase in the lymphocytes can be explained on mechanical grounds, the lymphocytes being flushed out of the tissues where they have developed. However this may be, and further researches may elucidate the point, suffice it for our present purpose to point out that some of the cellular elements of the blood are derived from the lymphoid tissues.

As to the other forms of leucocytes, the chief origin must be sought in the red bone marrow. Red bone marrow is found as we all know in the spaces of the cancellated bone tissue. It is the only kind of bone marrow found in the fœtus. In extra-uterine life when the bones become large the cavities are occupied by yellow marrow, which is practically fat. But such is the relation between red and yellow marrow that the latter yields itself up whenever necessary and red marrow takes its place until the normal state has been restored. In old age when the needs of the organism are great there is a return to the condition found in early life. The amount of red marrow is increased—an anatomical demonstration, if such were needed, of the second childhood. In view of the intimate connection between the red marrow and the blood it is fortunate for us that the red marrow can extend its area of distribution when the demands of the body require it.

The red marrow is found mainly in the extremities of long bones, in short bones, and in the bodies of the vertebræ. In the latter it merely suffices to squeeze the body of a vertebra, and then in the large venous sinus found in the floor of the neural canal a large amount of marrow will be found. Indeed film preparations made from the bone marrow direct when compared with those made from the contents of the venous sinuses obtained in the way I have mentioned show no appreciable difference either in the kind of cell or number.

The cells that arise in the bone marrow are the large mononuclear leucocytes, the polynuclear leucocytes, the polynuclear eosinophilous leucocytes, and the mast cells, and of course in addition the erythrocyte or red blood corpuscle. Indeed, Ehrlich puts forward as an axiom "the bone marrow exhibits the peculiarity that the cells it produces bear a specific granulation in sharp contrast to the lymphatic glandular system, which contains elements free from granules, in the whole animal series."

The granules are of two kinds, those reacting to acid dyes and those to basic dyes, and the importance of these granules is now becoming recognised. For the granules in the cells are to all intents in the same relation to the cells which convey them in the blood stream and out of it as those which are found in the cells of secreting glands. Nay more, for while the latter are fixed in position and are only able to produce a juice or a ferment which is utilised in the immediate neighbourhood of the cell, the granules in the corpuscle can be utilised, employed at a distance wherever the blood stream can convey it and further. The eosinophilous corpuscle of the blood stream may be called a uni-cellular gland in the same fashion as we call a goblet cell a unicellular mucous gland. But the eosinophilus corpuscle is more than this, it secretes a something—an alexin—which is capable of assisting in the active defence of the body against invasion by micro-organisms.

In this connection I wish to draw your attention to researches done a few years ago by the late Professor Kanthack, and Mr. Hardy, of Cambridge. They actually saw under the microscope the whole engagement, and they were able to follow the whole of the workings of the defence. Anthrax bacilli were injected into the lymph sac of a frog, and after a short time the lymph was withdrawn containing the microbes and the cells that had been called up to repel the invasion. Conspicuous among these were the eosinophilous corpuscles, weighted as it were with heavy shot in the form of the granules contained in the protoplasm. The corpuscles went straight for the germs, and when approaching them the granules were observed to stream in the protoplasm, and then on the side nearest the germ enter into solution and disappear. That they had been fired at the organism is beyond doubt, because in time the bacillus died. The cell came quite close to the germ, even enveloped it in an embrace, but it did not devour the victim, that was left to a phagocyte to do. When the bacillus was rendered harmless—in all probability killed—the eosinophilous corpuscle retired from the scene and recuperated, for soon the granules began to appear in the protoplasm and the corpuscle was again ready for action. Contrast this with say the granules in the cells of a secreting gland. These granules, we term them zymogenic granules, are the forerunners of the ferment of the particular juice formed by the gland, and they are used up during glandular activity just as the granules in the eosinophilous corpuscles are used up as Kanthack and Hardy described. Similarly the cell in the resting condition recovers itself and forms in its protoplasm products which can be utilised again when required. The changes described in the cells of the glandular epithelium of the newt's stomach during digestion by Carlier are almost similar to what has been observed in these eosinophilous corpuscles.

But if the eosinophilous corpuscle only stuns or maims the invader how is he removed from the field? Here nature can give the War Office points. Awaiting the result of the attack by the eosinophilous corpuscle is another leucocyte, and we recognise it as the polynuclear leucocyte, and this corpuscle is the scavenger—a cellular undertaker, the phagocyte. It throws out pseudopodia and envelopes the germ, and soon within its protoplasm appears a vacuole in which the germ comes to be found. The vacuole is a digestive vacuole, and contains a fluid which digests the microbe, and this has been seen to be gradually dissolving before the eyes of the observers. Thus the leucocytes with polymorphous nuclei not only ingest but they also digest, and what they cannot digest they get rid of by the simple expedient of thrusting it out of the protoplasm. That which I have just recounted to you is no fairy tale but has been actually observed under the microscope, and observers more competent there are none.

But let me refer you to a still more recent work by the great Metchnikoff. Metchnikoff utilised animal products and observed the way in which they were got rid of when placed in unusual situations. He injected into the peritoneal cavity of guinea-pigs spermatozoa, and after an interval withdrew the peritoneal fluid containing the cells of the fluid and the spermatozoa. And what did he find? That the spermatozoa had been engulfed by the leucocytes and that they had been ingested head first. The tail of the spermatozoon was still outside of the corpuscle, but the head, or several heads, had been taken into the leucocyte and by and bye the tails also were ingested. From observations of others that had been longer in contact with the sperms he found that the spermatozoa were not only ingested but also digested. This was the natural inference drawn from the appearance of the sperms in all stages of decay within the leucocyte.

And similarly with the blood of geese, which Metchnikoff also employed in his investigations The blood of birds, as we have already noticed, contains red blood corpuscles that are nucleated, and these corpuscles were found more easy to follow in the relations with the

leucocytes of the guinea-pig than the spermatozoa, but the results were the same, contact with the leucocytes brought about their solution, or disintegration, or ingestion. This investigation of Metchnikoff, which was published towards the end of 1899, practically supports the phagocyte theory formulated by that distinguished observer—a theory that was originally prompted, you will remember, by a careful study of the effect of an invasion of the daphnia, a transparent crustacean, by micro-organisms. It taught us, and teaches us still, that there are agencies at work within the body that prevent, or at least attempt to ward off, an invasion of the body by organisms that are foreign to it, and this is further exemplified by the way in which portions of the body that are no longer of use to it may be got rid of. Phagocytes operate upon the line of demarkation between a gangrenous patch and the living; through their agency the dead part is removed. Portions of foreign tissue, such as ivory pegs inserted into the tissues, are eroded, bone is constantly being absorbed by cells acting in a somewhat similar fashion. Tissue that has run its course and is worn out and requires removing, since its place has been taken by younger and more vigorous structures, comes under the influence of these carnivorous cells, which act as the pariah dogs of oriental cities. These cells are reared in the bone marrow, and we have said sufficient to show how necessary the bone marrow is to our very existence.

As to the value of the spleen as a blood forming organ in adult life, I am afraid we are not at liberty to form an opinion. It has been said that this organ is the grave of the red corpuscle, and that here many white corpuscles arise. Certain it is and never better seen than in the spleen of the horse that many red blood corpuscles are broken down and destroyed here. The amount of blood-colouring matter and dêbris of the erythrocytes is remarkable in this organ of the horse. In the malpighian corpuscles of the spleen we know that certain lymphocytes arise, as they arise in other masses of lymphoid tissue.

I do not see any reason to change an opinion that I have held and taught for some years now, that the spleen is merely a modified lymphatic gland, probably midway between the hæmolymph glands and the true lymphatic glands; and that the relation between the latter and the spleen is a close one I think is shown by the splenectomies that have succeeded. In cases where the spleen has been removed as the result of injury or disease, or during the course of a research, the after result has mainly been a compensatory hypertrophy of the lymphatic glands and lymphoid tissue generally.

Kurloff's experiments upon guinea-pigs proved that during the year succeeding the operation the number of lymphocytes increased enormously, and that during the second year the number of lymphocytes fell but the eosinophils increased in number. From his experiments he concluded that the spleen of the guinea-pig plays an unimportant part in the production of white blood corpuscles.

The liver during fœtal life plays an important *rôle* in the formation of blood, and comparatively early becomes, relatively to the size of the embryo, enormous. Its blood forming function however disappears as the post-embryonic functions become more and more manifest. It is of interest however to note that in the liver at this early period there is no difficulty in discovering large multinucleated cells which are quite similar to those cells noted in bone marrow and called the mycloplades. What the exact significance of these macrophages is we are unable to say.

Lastly I must mention the mast cells, the *mastzellen*. These mast cells are granular, but the granules are different from those found in the eosinophilous corpuscles, they stain differently—metachromatically. Moreover these mast cells are said to possess a peculiar halo which is referred to the secretory activity of the cell and hence the halo is considered as an expression of a vital secretion of the substance of the mast cells externally. A condition that Prus has brought forward in the so-called purpura of the horse is also to be interpreted as a secretory process of the mast cells. He describes young mast cells from the hæmorrhagic foci of the wall of the gut, on the margins of which bodies of various sizes appeared and which differ essentially from the mast cells themselves by staining. Nevertheless Prus comes to the conclusion "that the degenerating young mast cells secrete a fluid or semi-fluid substance, which as a rule sets on the surface of the cells, but also, more rarely, in their interior." Ehrlich, in his conclusions upon the granules present in the interior of the cells, says "that in general the granules of the wandering cells are destined for excretion. This elimination of the granules is probably one of the most important functions of the polynuclear leucocytes."

I am afraid that in a very uninteresting manner I have wearied you with all this account of the blood corpuscles but I hope that it will lead us to appreciate better what a complex fluid the blood really is, and what a vista a close examination of it opens up. What a very different conception we are bound to have of such a complex fluid tissue, or sporadic mesoblast as Kanthack and Hardy named it. Cells that are for the respiration of the tissues, others that play the part of Cerberus, and others again that behave as if they were glandular epithelium located in a gland with a specific ferment to manufacture, and all floating in a highly nutritious fluid from which all the diverse cells of the body drink their sustenance, and from which they elaborate their own peculiar products. Recently, as we know, the horse has been called upon to give up his blood in the production of serum used against diphtheria. The horse not being a subject of diphtheria is supposed to have what is termed a natural immunity to the disease, and that being so if we strengthen, amplify that immunity we may draw upon the horse's blood to provide the serum requisite to fortify other less fortunate beings. But in the light of what we have already mentioned may not this immunity be brought about by the presence of cells carrying granules which secrete a substance that is injurious to the growth of the diphtheria germ, and may it not be the case that the injection of diphtheria toxins stimulates the cells and cell territories to increased activity, and as a consequence the liberation of greater and greater amounts of anti-toxins. We know that the presence of certain poisons or substances circulating in the blood has the power of attracting or repelling certain corpuscles in the blood; this phenomenon is chemiotaxis. Certain substances will induce for example a remarkable outflow of polynuclear corpuscles, but there is not an eosinophilous corpuscle to be found in the field of the microscope; then the substance is said to be positively chemiotactic to the polynuclears and negatively so to the eosinophils. Ehrlich says "It seems, generally speaking, that the bacterial metabolic products formed in human diseases which are positively chemiotactic for the polynuclear neurophil cells are negatively chemiotactic for the eosinophils and *vice versa*." Now may it not be the case that an invasion say of micro-organisms which are positively chemiotactic to the polynuclears not only stimulates the corpuscles and attracts them to the point of the invasion but that the stimulus may, long after the invasion has been repelled, still influence the production of those elements that succeeded in arresting the progress of the invader. If this is so then we may understand how it is that what is termed immunity is usually conferred by one attack of a disease, and that as the immunity gradually passes off the animal becoming more and more prone to another attack. That the corpuscles in the blood act like the indicator in a very delicate barometer there is no doubt, and clinical medicine is

more and more as days go by producing evidence of this. In febrile diseases pneumonia, erysipelas, articular rheumatism, etc., there is a leucocytosis, and also in certain toxic conditions as in poisoning by chlorate of potassium, phenacetin, and in protracted chloroform narcosis. The eosinophilous corpuscles are increased in bronchial asthma, in acute and chronic skin diseases, and in the helminthiasis. The condition has also been noticed in trichinosis and in malignant tumours. But I need not detain you longer, suffice it to say that in some cases that I have examined in the horse, the conditions observed have been as above mentioned. There is a hyperleucocytosis in strangles, there is an eosinophil leucocytosis in intestinal helminthiasis with apparently derivation of the eosinophilous corpuscles to the part—for I have seen the submucosa of the small intestine packed with large eosinophils ; and that there is a polynuclear leucocytosis, or an abundant leucocytosis or phagocytosis, I have also seen in a case where an open joint had taken on septic appearances, though when opened into after death the synovia was still clear though blood-stained. I have no hesitation in saying that the joint would eventually have become the subject of a purulent arthritis, a streptococcus was easily demonstrated, but what interested me especially was to find the enormous number of polymorphous nuclear cells such as are found forming the pus corpuscles of abscesses.

I will leave for another occasion the discussion of the examination of blood during the onset, progress and decline of disease, but to me a closer investigation into the changes occurring in "the sporadic mesoblast" in disease promises rich rewards to those who have the time to follow all its manifold and unceasing fluctuations. For the blood is ever in a condition of unstable equilibrium, and though we may give averages of its cellular contents and number the corpuscles by ingenious instruments, observing the cells found in a cubic millimetre, still every one must admit that the cell content is never exactly the same.

A CASE OF SUBACUTE GLANDERS.

By John Fawcett, M.D., M.R.C.P. Lond., Assistant Physician to Guy's Hospital; and

Walter C. C. Pakes, M.R.C.S. Eng., L.R.C.P. Lond., D.P.H. Cantab., Bacteriologist to Guy's Hospital.

A man, aged 45 years, a cab proprietor, was admitted into Guy's Hospital on August 4th, 1900, under the care of one of us. Three weeks before he was taken ill a horse in his stables, supposed to have been suffering from glanders, had been killed. The patient first felt ill on July 9th, and between this time and the date of admission he had a small abscess on the left forearm, which was opened, and elsewhere on the body several other swellings which did not suppurate. During this period the patient was so ill that he had to remain in bed, his temperature being raised throughout, and on several occasions reaching 104 F.

On admission the patient, a big stout man, was obviously very ill. He was very tremulous, but breathing comfortably. His temperature was 103·2°, his pulse was 100, and his respirations were from 30 to 40 per minute. On the left forearm was a shallow sinus which led into the above-mentioned abscess cavity and from which exuded a little thin discharge. Over the back of the right elbow there was some cellulitis and also over the back of the first and second right metacarpal bones. A similar swelling was present on the inner side of the left knee. These swellings somewhat resembled patches of erythema nodosum. No fluctuation was detected in them nor any œdema of the surrounding tissue. A few mucous râles were heard over the bases of the lungs posteriorly. No physical signs were present on examination of any other of the organs. The urine did not contain albumin. There was no glandular enlargement and rhinorrhœa was not present. There was a small furuncle on the buttock, from which a cultivation was made. For the first three days after admission the condition of the patient did not materially alter, but on August 7th he became distinctly worse and had recurrent attacks of difficulty in breathing, saying "he was sure he would be choked." On the 8th a crop of small papules, which became pustular, appeared on the back. On the 9th there were a few fresh papules on the right thigh. The left knee joint was found to contain some fluid. During this day and the next the attacks of difficulty in breathing became more marked and the patient becoming gradually worse, died on the 10th. Cultivations were made from the furuncles, but up to the time of death no positive result had been obtained.

Necropsy.—The lungs were œdematous, but there were no nodules or any pneumonic areas to be seen. All the other viscera appeared normal to the naked eye and no foci of inflammation or suppuration were present anywhere in, or among, the viscera. The left knee-joint contained a thin, yellowish, glairy fluid and over the right elbow the tissues were infiltrated with a similar oily fluid. Cultivations were made from the heart blood, the spleen, and from the fluid in the region of the elbow and from the left knee-joint.

Remarks.—The case was one of subacute glanders of a month's duration. During life, although the history and some of the signs and symptoms suggested the possibility of glanders, yet the clinical evidence, in the absence of bacteriological proof, was not sufficiently clear to allow of a positive diagnosis of glanders being arrived at. Although the patient was very ill the local manifestations of the disease were slight and might have been those of a subacute pyæmia of other origin. They were (1) subcutaneous swellings, (2) a few small furuncles, (3) a small abscess in the left forearm, and (4) the presence of fluid in the left knee-joint. There were no typical ulcers of the skin, no well-marked bullous or pustular eruptions, no rhinorrhœa, and no intra-muscular abscesses, the presence of any of which would have helped to distinguish the case with more certainty as one of glanders.

Bacteriology.—The small furuncle upon the buttock was examined microscopically and culturally. Bacilli were seen in the pus which resembled the bacillus mallei, but the cultures were full of staphylococci and no bacillus mallei was found upon them. The heart blood, the spleen, and the fluid from the knee-joint were examined and mixed cultures containing a glanders-like bacillus were obtained. These were plated and pure cultures of the bacillus were obtained. The bacillus had all the typical morphological appearances and gave the staining and cultural reactions of the bacillus mallei. A small quantity of a glycerine-agar culture was inoculated into the peritoneum of a male guinea-pig and after 48 hours its testicles were distinctly enlarged and inflamed. It was killed after four days and pus containing bacillus mallei was found inside the tunica vaginalis and small abscesses in the body of the testicle which on section were seen to contain characteristic bacilli. There can be no doubt, therefore, that the case was one of glanders. It was suspected before death that the bacilli which had been found were really glanders bacilli, but owing to the contamination with other bacteria it was not proved. There would appear to be little doubt that had the abscess upon the forearm been examined bacteriologically the bacillus mallei would have been found. There seems also to be little doubt that had it not been for the bacteriological examination the case would not have been certainly diagnosed as one of glanders.—*The Lancet.*

VETERINARY SOCIETIES.

SOUTH DURHAM AND NORTH YORKSHIRE VETERINARY MEDICAL ASSOCIATION.

A meeting was held in the North Eastern Hotel, Darlington, on Friday, 14th December, 1900. There were present Mr. G. E. Gibson, Sedgefield, in the chair, Messrs. C. G. Hill, and W. N. Dobbing, Darlington; J. G. Deans, Bishop Auckland; W. H. Blackburn, Barnard Castle; A. Peele, West Hartlepool; E. H. Pratt, Northallerton; John Wilson, Yarm; E. R. Gibson, Seaham Harbour: G. R. Dudgeon, Sunderland; and W. Awde, Stockton-on-Tees. Messrs. W. J. Foreman, Leadgate; and R. S. Collihole, Bishop Auckland, were present as visitors.

Apologies for non-attendance were received from Mr. J. H. Taylor and Mr. A. A. Stevens.

Previous to the meeting Mr. J. G. Deans performed an operation for Bog Spavin on a horse's hock in Messrs. Dobbing and Taylor's yard, Skinnergate.

The minutes of the previous meeting were taken as read and confirmed on the proposition of Mr. Dobbing, seconded by Mr. A. Peele.

Specimens.

The Secretary produced the femur and one side of the pelvis of a colt, rising two years old, in which the head of the femur was broken off and had become united to the acetabulum by ossific deposit. Mr. Awde was called to the animal as a foal in July, 1899, and was informed that it had fallen backwards over on a cement floor and then rolled on to its side. As there was distinct crepitus at the hip joint the opinion formed was that there was a fracture, and the animal ordered to be destroyed. Subsequently he was informed that the foal had been given away to a neighbour who called in a local bone-setter to see it. This individual said the stifle was out, and professed to put it right and charged 14s. for his service. The animal was alive until October 8th, 1900, when it was destroyed, and a post-mortem made.

Mr. G. E. Gibson mentioned a case met with in a three year-old cart horse. He usually stood with his fore legs crossed, seemed stiff in his neck, when his head was drawn to the ground he groaned very much and pressure on the neck caused pain. When moved did not seem to have proper control of himself. Gradually became worse and was destroyed. The bones of the cervical and dorsal vertebræ were shown; they did not seem to have undergone structural change but were intensely red in colour.

Mr. A. Peele had seen a beast held in the same way and then mentioned a case of tuberculosis met with in a horse. Cart gelding, five years old in March last, was in good condition but flinched on turning collar round on neck. There was a diffuse swelling on the upper third of trachea. Temperature 102 or 103°, sub-acute pleurisy; temperature fluctuated; a cough present. Went on for a few months and then swelling appeared at base of trachea; he gradually lost flesh, and at exercise made a noise and was disinclined to turn round. *Post-mortem*: Gland enlarged, upper third of trachea also bronchial and mediastinal glands very much enlarged, so were the sub-dorsal and sub-lumbar, and there were the usual growths on the spleen.

Votes of Condolence.

The President proposed a vote of condolence to Prof. W. O. Williams and the other relatives of the late Prof. W. Williams, Principal of the New Veterinary College, Edinburgh, and an honorary associate of this Association, and in doing so said that the deceased gentleman had always been ready to place his services at their disposal whenever they wanted them, and that the profession had lost a good friend by his death.

The Secretary seconded the proposition, and it was carried in silence.

Mr. Hill also proposed a vote of condolence to the relatives of the late D. C. Barningham, of Darlington, who died on Dec. 9th at Pretoria, while serving with the British Army. This was seconded by Mr. Dobbing and carried unanimously.

AN OPERATION FOR BOG SPAVIN.

J. G. Deans, M.R.C.V.S., Bishop Auckland.

Before proceeding to read you a short treatise on the operation which you have just seen performed, and also on some experiments I have been trying, *re* the transfusion of blood from one animal to another, I must apologise for not being able to introduce the subject of "Doping," as I have been requested to appear before a meeting of the Stewards of the Jockey Club to give what information I can with regard to the practice of the same in this country.

Reverting to the operation of this morning; the condition called bog spavin is a very vague term indeed, it may mean anything from a slight dilation of the capsule of the hock joint to a serious condition of synovitis and exudation inflammatory. The anatomical structure of the hock joint I need not here describe, as I have no doubt you are all familiar with that, but I will at once go on to explain the different causes which usually tend to produce this very annoying condition (from a veterinary point of view) and also a great source of loss to the breeders of horses, more especially in Scotland, where Clydesdales are so prevalent. In trying to produce a type of animal to suit the tastes of the Clydesdale fanciers of late years the length of pastern required, and the fineness of bone has, in my opinion, been carried too far.

There is a medium in all things, and although I am partial to the Clydesdale breed of horses I most thoroughly condemn this excessive length of pasterns which has been aimed at. When you get those long pastern joints, you as a consequence find that the position of the joints of the hind limbs are all altered, and that you in conjunction with the above find straight hocks which I assert is the cause of bog spavin in 60 per cent. of the cases to be found in young animals. Some other cases are produced by want of exercise, but when caused in this way they are only temporary, and can be removed without surgical treatment. Severe exertion, sprains etc. may also cause bog spavin but what we are most interested in at present is the treatment and for the removal of same. You are all familiar with the various means that have been adopted for the purpose of diminution of the synovia, viz., firing, blistering, cold and hot applications, pressure, etc., but the treatment I would suggest to you for consideration to-day is the removal of the fluid by the direct operation which you have just seen performed, and what I agreed with Mr. Gibson (our President) to read this paper to-day for was that the younger members of the profession present might find out where my operation fails, and improve on the same. I don't say that my operation is a complete success in every case, but what I do assert is that I have never had any bad results from an operation of this kind, unless in one case, and that was due to the animal having to walk home three or four miles after having been operated upon, synovitis supervening and bony deposits resulted, which took a year before the animal was fit to work, and this case is one in several hundreds which I have operated upon in England, Scotland, and even as far as Germany within the last three years.

I will now try to explain the operation as performed this afternoon. In the first place you must see that all

instruments are rendered thoroughly antiseptic before throwing your animal. This I would always do, unless there are some good stocks handy, for you are very likely to lose your trocar or canula if the horse kicks, not to say the danger of injuring the joint. The skin must be washed and disinfected, then after locating the vena saphena so as not to injure it, the trocar may be plunged right into the true hock joint until the point of the trocar grates against the bone. (I may here state that several cases of failure to produce a flow of synovia have been caused by the operator not having pierced the capsule of the joint. When assured that the canula is now in position, withdraw the trocar and immediately the synovia will flow, the pressure being greater inside than out, no air up to this stage having been admitted. Next fix on the instrument made by Messrs. Arnold & Sons at my suggestion, the smaller syringe at the side having already been charged with the caustic fluid about to be injected. I cannot here explain the instrument but you will be able to see for yourselves that the synovia was removed and the caustic injected without the admission of air. This I hold is the advantage to be derived from my operation, as it has never before been possible to withdraw the synovia from a joint and inject a fluid without the admission of air. What I use as an injecting fluid is :—

℞	Hyd. perchlor.	grs. xx.
	Meth. spts.	℥i.
℞	Decol. tinct. iodine	℥i.

Mix a dram of each and inject into the joint.

Transfusion of Blood.

In this operation I have not arrived at a very advanced stage, not having had an opportunity of experimenting as often as I should have liked, but from what I have seen I am confident that were experiments to be carried on by someone who could give his time and energies to the advancement of veterinary surgery great results might be obtained.

In pyæmia and leucocythemia and in recent cases of hæmorrhage, before the effects of medicine can produce any good results this operation may be adopted. In some cases of pyæmia and leucocythemia the system will not re-act in any way to the introduction of remedial agents ; in fact, they seem to have no effect. It has often been proved what a remarkable quantity of saline fluid may be injected into the connective tissue and be absorbed, and also directly into the abdominal cavity and absorbed by the omentum.

I have experimented in the direct transfusion of blood from one animal to another, and I have photographs here, one of the horse taken before, and one after the operation, and the effects were such as to encourage me to continue the operation. Great difficulty crops up in these cases where you work in the dark as it were. In the first case I found that the blood would not flow in the tube from one horse to another, this being due to the coagulation of the blood caused by the cold. Again it is so difficult to keep the animal you are extracting the blood from quiet. The patient is usually quiet enough. I here show you the simple apparatus used by me so that your fertile brains may suggest to you some improvement. Two pieces of indiarubber tubing joined in the centre with a smaller piece of glass tubing. This latter is so that you may see the blood stream, two pieces of glass tubing, pointed, fixed in the end of the indiarubber. The animals being brought together with their heads facing each other the jugular vein of the patient is opened and the jugular vein of the healthy animal is also opened in the usual way. One end of the tubing is inserted into the jugular vein of the healthy animal in an upward direction, that is facing the blood stream, and allowing the blood to flow for a few seconds, so as to prevent the admission of any air into the jugular vein of the patient the other end is inserted in a downward direction into the vein of the patient.

Now your difficulty begins, to keep your animals quiet and also to keep the blood flowing and to regulate the quantity. I tried wrapping the tube in hot cloths, but this did not answer well, and I may say I am not yet satisfied with this part of the operation, but the best thing I could find was a narrow wooden trough filled with warm water. A lead pipe I have also tried with a tube running through it and a hole in each end of the pipe (of course at the top) so that the water did not run out. When this difficulty has been overcome the treatment of leucocythemia, pernicious anæmia and poverty of the blood from long debility, as is often seen in patients who have been abroad a great deal, will be of great benefit to the medical and veterinary profession, and I might make a wild suggestion as the emanation of an enthusiast that where a patient is affected or suffering from any of the aforementioned diseases the blood could be easily removed altogether and a fresh supply introduced, of course gradually, and thus prolong the life of the patient if human, and in the lower animals even good might follow. When a foreign body is introduced into the blood stream the phagocytes at once have a battle with them, and it is a survival of the fittest. If the strangers, or Boers we might call them here, are in the minority, the Britons will win, but if the Boers are too many for the phagocytes or Britons then the patient suffers. What I suggest would be, that when a patient could be got and other persons also could be got willing to lend their blood, the circulation of the patient might be carried over an area of six individuals, and thus in having so many reinforcements to fall back on, the Boers, or the Foreign bodies of diseases in the blood of the patient would be completely beaten by this dissemination.

The transfusion of saline fluid is often adopted in the human subject and I have been experimenting during the last month, but as I have not come to any definite opinion I cannot say very much about it, but this I found out, that the connective tissue can absorb two pints of saline fluid (at the same temperature of the blood) behind each elbow in from 7 to 8 minutes, therefore in fainting or collapse from hæmorrhage a small quantity could be injected directly into the blood stream, and also at the same time into the connective tissue and also into the abdomen.

I cannot but expect a most severe and caustic criticism and also advice from the wiseacres of our profession not to venture on so foolish and dangerous experiments, but if my disjointed and rambling remarks will only tend to the private study and experimental research of some of you gentlemen present, I will have accomplished the object which I had in reading this paper ; and no man can dabble in science or experiments of any kind without learning something, be it only to show him how little he knows and how wonderfully the mechanism of animal nature is made up.

Discussion.

Mr. Dudgeon thanked Mr. Deans for the demonstration he had given that day on the horse's hock, and said that in transfusion, as the blood is the life great care should be taken that disease is not so transmitted. As it would be easy to do this in such diseases as glanders, tuberculosis, etc. If 50 per cent. of recoveries took place he thought the operation for bog-spavin should be performed.

Mr. Dobbing stated that he did not believe in exercise after the operation for bog-spavin, as he had seen one case which was travelled after being operated upon and which did very badly.

Mr Blackburn believed in breeding horses without bog-spavin. He met with most cases in Clydesdales.

When he attended the Llangattock stud he never saw a case. Mr. Deans had demonstrated that day that a horse's hock could be opened.

Mr. PEELE had admired the way in which Mr. Dean's operated on the hock that day, but thought it rather risky. Had no experience of transfusion, but thought there was room for improvements in the instruments employed for that purpose.

Mr. E. R. GIBSON thanked Mr. Deans for operation on hocks; he thought the strength of the solution injected might be reduced as he had noticed excessive pain in the joint for two or three days after. Had seen one case in which it proved of no great value, the colt had to be assisted to his feet and ultimately died of tetanus.

Mr. WILSON thanked Mr. Deans for his operation and paper and asked him if he thought it was really necessary to inject a caustic into the hock at all. He had injected tinct. iodine into enlarged stifle joints after drawing off the fluid.

Mr. HILL does not believe in injecting iodine. Thoropin much worse in his opinion and believes pressure would be better applied after withdrawing the fluid. Transfusion should be carried out, and might answer well in suitable cases and with improved instruments.

Mr. G. E. GIBSON had seen two operations previously, one of which was cured. The other was three times operated upon. He had operated on seven or eight stifle cases, and generally used solution of potassium iodide. He had no experience of transfusion of blood.

Mr. DEANS replied to the various speakers. He said that he did not believe there was much pain after the operation. In 80 per cent. of his cases the injection given was found to be most successful. He had found it to answer in stifle cases, and also in cases of foal-evil. He had operated on about 300 cases of which about 50 per cent. were successful.

Mr. G. E. GIBSON proposed a vote of thanks to Mr. Deans for having brought the subject forward. Seconded by Mr. Dudgeon and carried.

Mr. DEANS suitably replied.

The TREASURER having reported that a member of the Association was in arrear of subscriptions for five years and no answer having been vouchsafed to several applications, it was decided to strike his name off the list of members.

Mr. STEVENSON, of Durham, having sent in his resignation of membership, Mr. Dudgeon proposed, and Mr. Peele seconded that he be asked to reconsider the matter. Carried.

A letter having been read from Mr. Richard Scott, New Veterinary College, Edinburgh, *re* proposed memorial to the late Principal Williams, it was decided to support any movement in connection with that object.

Mr. W. J. FOREMAN, M.R.C.V.S., Leadgate, was proposed as a member of the Association.

WILLIAM AWDE, *Hon. Sec.*

The Brown Animal Sanatory Institution.

Notice is given that, in accordance with the Will of Mr Brown, a course of five lectures, with special reference to the Work of this Institution, will be delivered by the Professor-Superintendent (J. Rose Bradford, Esq., M.D., D.Sc., F.R.S.), at the University of London, South Kensington, S.W., on Tuesdays, February 26th, and March 5th, 12th, 19th, and 26th, at 5 o'clock each afternoon.

Subject.—The Protozoa in their relation to Disease, with especial reference to the so-called Tsetse-Fly Disease of South Africa. The lectures are free to the public.

BRITISH CONGRESS ON TUBERCULOSIS

FOR THE PREVENTION OF CONSUMPTION.

President.
H.R.H. THE PRINCE OF WALES, K.G.

President of Organising Council.
The Right Hon. The EARL OF DERBY, K.G.

Chairman of Organising Council.
Sir WILLIAM BROADBENT, Bart., M.D., F.R.S.

Chairman of Finance Committee.
Sir JAMES BLYTH, Bart.

Hon Secretary-General.
MALCOLM MORRIS.

The British Congress on Tuberculosis which His Royal Highness the Prince of Wales has graciously consented to open will be held in the Queen's Hall, London, at 3 o'clock on the afternoon of Monday, the 22nd July, 1901.

This Congress, which is the result of representations made at Berlin and elsewhere, will be the most important step that has yet been taken in this country with a view to applying in a practical manner the information and experience already acquired as to methods for stamping out consumption. It is therefore hoped that, for the sake of the National well-being, it will be carried out in a manner worthy of the position of this metropolis in the civilised world.

A consideration of the cost of previous congresses of a similar nature leads to the anticipation that a large sum will be necessary. The Council having in view the generous manner in which corporations and societies on former occasions, especially on the occasion of the Hygiene Congress, supported a movement of this kind, trust that all bodies interested will be represented by delegates and that the list of contributors will be a record one.

PARLIAMENTARY.

In the House of Commons on Monday, Feb. 18.

HORSES FOR THE SOUTH AFRICAN ARMY.

In reply to Mr. PHILIPPS (Pembroke),

Lord STANLEY (Lancashire, Westhoughton) said,—The total number of horses and cobs purchased for South Africa between October, 1899, and January 31st, 1901, was as follows:—Great Britain and Ireland, 35,775 horses, 3,827 cobs; other countries, 36,314 horses, 35,506 cobs. Of the former about 80 per cent. were sent to South Africa. The English and Irish were considered the best, and the next best were the American and Canadian. While purchases are still going on it is not considered expedient to state the prices.

Mr. HEALY (Louth, N.) asked for the figures for Ireland and Great Britain separately.

Lord STANLEY could not give them offhand.

Captain DONELAN (Cork, E.) asked the Financial Secretary to the War Office if he could state the number of troop horses purchased for the purpose of the South African war in Hungary, America, and Ireland respectively between January 1 and December 31, 1900, and whether any agent was employed by the War Office during that period for the purchase of troop horses in the south of Ireland.

Lord STANLEY.—The figures are as follows:—Hungary, 7,000; America, United States, 21,000; Canada, 3,750; Ireland, 6,178. Of those bought in Ireland about 20 per cent. were for units at home. Colonel Hanford was the agent employed in Ireland during the period referred to, and he bought horses in all parts of the country.

Sir E. ASHMEAD-BARTLETT (Sheffield, Ecclesall) asked

if in the American figures the horses from the Argentine were included.

Lord STANLEY said yes, these were included, but he could not say what proportion came from the Argentine.

Captain DONELAN desired to know why preference was given to Hungary and America in view of the fact that Irish horses are the best in the world.

Mr. FLAVIN (Kerry, N.).—And no part of the war tax is paid in Hungary and America. (Hear, hear.)—*The Times.*

ARMY VETERINARY DEPARTMENT.

From *The London Gazette*:

WAR OFFICE, PALL MALL, Feb. 8.

From General Right Hon. Sir Redvers Buller, V.C., G.C.B., K.C.M.G., to Field-Marshal Right Hon. Lord Roberts, V.C., etc., War Office, London, S.W.

VETERINARY DEPARTMENT.

Vet.-Maj. (local Lt.-Col.) C. Rutherford was, for a time, Senior Veterinary Officer on the Lines of Communication. Of high professional attainments and good business capacity, he is deserving of promotion.

Vet.-Capt. R. W. Rayment, Senior Veterinary Officer, Lines of Communication.—Has held a position of considerable responsibility, and has proved himself equal to the occasion. I believe him to be above the average, professionally, and recommend him for promotion.

Vet.-Lieut. G. M. Williams,
Vet-Lieut. F. W. Wilson,
Vet.-Lieut. R. C. Cochrane
have done good work.

C.V.S. D. J. Quinlan, attached to Army Veterinary Department.—Has been in charge of the Veterinary Hospital, Remount Depôt, Mooi River, and given every satisfaction, and done much good work.

C.V.S. T. Judge, of Heidelberg, was severely wounded on railway near Vlakfontein, Feb. 6.

OPERATIONS IN THE ORANGE FREE STATE.

From Field Marshall Lord Roberts to the Secretary of State for War, 31st March, 1900.

The following officers have distinguished themselves during the recent operations:—

Vet.-Capt. L. J. Blenkinsop, D.S.O.,
Vet.-Lieut. H. T. Sawyer.

NATAL FIELD ARMY.

From Lieut.-General Sir Geo. White to the Secretary of State for War.

The following officer has carried out the duties of his Department with advantage to the State and credit to himself:—

Vet.-Lieut.-Col. I. Matthews, P.V.O.

From *London Gazette*, Feb 15:

Imperial Yeomanry (9th Batt.)—Temporary Vet.-Lt. A. Bate resigns his commission.

Yeomanry Cavalry, Ayrshire (Earl of Carrick's Own.)—R. W. Russell, gent., to be Vet.-Lieut.

Vet.-Lieut. W. J. Tatam to be Vet.-Capt.

C.V.S. S. Stockman, W. W. Brownless, J. M. Lund, T. Rennie, and A. Leach left for England on Feb. 12th in the "Canada."

Feb. 19.

C.V.S. H. F. Vulliamy, F. G. Woodruffe, F. Lindsay, J. R. Farrar, and C. D. Robinson arrived at Southampton on Saturday morning in the "Orotava" from South Africa.

ARMY ORDERS, 1900.
Army Order 251, December, 1900.

Promotion of Veterinary-Lieutenants in the Auxiliary Forces.

Veterinary Lieutenants in the Honourable Artillery Company of London, Yeomanry, and Volunteers will, in future, be eligible for promotion to the rank of Veterinary-Captain after ten years service (instead of fifteen years). The necessary alterations will be made in paragraph 17 of the regulations for the Honourable Artillery Company, paragraph 41 of the Yeomanry Cavalry regulations, and paragraph 68 of the Volunteer regulations.

CORRESPONDENCE.

A REPLY TO "VETERAN"

Sir,

Veteran's letter on "Veterinary Assistants and Others" might as well have also included red herrings. The red herring has been drawn across the trail here and not very skilfully. I believe that the original letter of "Veteran" countenanced and advocated the employment of unqualified assistants.

I have some respect for old age, and especially that mellowed old age that can adapt itself to the ever changing phases and conditions of science and art, of thought and knowledge. For a man who has learnt nothing and forgotten nothing, even if he conducts a successful practice, is an author and holds, or did hold, a commission in Her Majesty's Army, I cannot profess much admiration or regard. Presumably we are never too old to learn, and if the experience of both youth and age leads "Veteran" to the conclusion that unqualified assistants are his best servants, any attempt to convert "Veteran" will be so much ink wasted, in my opinion.—Yours sincerely,

G. MAYALL.

VETERINARY ASSISTANTS AND OTHERS.

Sir,

It seems to me that those assistants who are continually grumbling have mistaken their calling. The lot of an assistant certainly is not an enviable one, but it is decidedly better now than it was. Just put the clock back ten or a dozen years! In those days a man after obtaining his diploma and having served perhaps two or three years pupilage could scarcely earn bread and cheese. Principals were able to obtain good practical qualified men almost for the asking. The Army Veterinary Department received too many applications, and a vacant district in which to start a practice could scarcely be found.

Things are different now, assistants are offered two or three guineas a week; they are asked to practice in some districts; Government officials are frequently advertising for qualified men. If a veterinary surgeon has private means or is lucky enough to be engaged to a young lady of means and aspires to society and kissing royalty the Army will accept him. Students, even at College, can command a small pittance.

What more do assistants want? Do they expect everything they touch to be turned into gold? It is related in Latin that Midas was not satisfied when the Gods decreed that everything he touched should be turned into gold, and I am afraid this would be the case with some veterinary surgeons.

The prospects of veterinary surgeons should, in my opinion, be properly pointed out to parents before they educate their sons for the profession. If this were done there would be far less grumbling after obtaining the diploma. To the averge country practitioner his gross earnings will be £200 or £300 a year for seven days and an occasional night of hard work during the week, savored with chronic grumbling respecting the charges,

and a few bad debts, so that those assistants who grumble about their principals must remember that their lot is not a too enviable one.

In a few years time it seems to me there will be a genuine cause of grievance. Law of survival of the fittest applies as much to our patients as it does to ourselves. As man increases other animals must decrease, consequently the horse as a beast of burden must be, and is being, dispensed with. Towns will not in the future be able to support so many veterinary surgeons for it is quite certain that dogs and cats will not take the place of the horse in our ledger. It is of course doubtful whether the young gentlemen who are obtaining their diplomas now, accustomed to sundry years of gaiety in the West End of London, will care to settle down in these poor agricultural districts ; it is quite certain if they do not a return to quackery will inevitably follow.

The veterinary profession is poor, there is no money in any profession. It was remarked at a meeting of one of our societies quite recently that there was something to live for besides the making of money. To solve this problem we must search the scriptures. We are told "It is easier for a camel to go through the eye of a needle than for a rich man to enter the kingdom, which I trust one and all of us, assistants, principals, "poor veterinary practitioners," shall be deemed worthy to inherit in the life to come as the reward of our labours.—Yours faithfully,

G. UPTON.

FELLOWSHIP EXAMINATION.

Sir,

In reply to W. B. G's. inquiries in your last issue *re* questions at the above examination, if he wrote the Secretary of the R.C.V.S. he would furnish him with full information.

The exam. is by no means stiff, except the fee £15 15s. which, I must confess, is the largest obstacle for young men ; however, few will be prevented on that account.

The questions are thoroughly practical, and a man of ordinary intelligence should have no difficulty answering them.

The pathological specimens to be recognised are of the ordinary class, and the crux on the thesis conducted in a common-sense manner. It is a pity more men don't go in for the exam. as there would be a two-fold gain, viz., to themselves and the finances of the R.C.V.S.—Yours truly,

F.R.C.V.S.

METHODS OF CASTRATION.

Sir,

As one of the critics complained of by Mr. Reeks in your issue of January 5th please allow me to offer a few remarks.

In the first place, for my own part, I beg to offer him an apology if he thinks I exceeded the bounds of fair criticism. He does not mention the particular article he took such exception to, and I rather wish he had.

On looking through the two articles again I really fail to see that the writers were so rude as he infers. We each defended a particular method of castrating at the expense of his favourite one, and I think drew fair comparisons. As a matter of fact I agreed that his method was the best for country practice. If Mr. Reeks will kindly again read the articles I think he will confess that neither of us flatly contradicted him, nor did we say that his method, viz., actual cautery, was not surgery. It is true comparisons were drawn as to which methods were the more surgical. It was not necessary in my paper to describe the method I supported lengthily, as that had already been done in a paper published in *The Veterinarian* and quoted in my article. I simply asked Mr. Reeks to, as it were, give other methods a fair hearing, as his paper purported to describe and compare all. I agree with him that it is difficult to define a surgical operation and where it begins and ends. His definition makes it capable of a very wide meaning as it would include, for instance, the tearing of the cord with the teeth, mulling etc.—Yours faithfully,

G. K. WALKER.

India, Jan. 30.

GLANDERS IN MAN.

Sir,

It has been somewhat surprising to me for years that more cases of glanders in the human being are not reported, especially in London, where glanders is so common. I remember years ago being asked by an eminent pathologist and physician to see patients which he suspected of being affected with glanders and to give him my opinion respecting the similarity of his patients' symptoms with those we find in the lower animals, and I well remember how difficult it was for me to see a likeness between the symptoms of glanders in the human subject and the lower animals. The cases that I saw then resembled those of farcy in our patients as apparently did the one you reported in your issue some time back, and I can easily understand the ordinary medical practitioner—who is, as a rule, unacquainted with the symptoms of glanders in our patients—overlooking similar symptoms in his patients and mistaking or confounding them with other diseases with which he is more familiar. Therefore, I think it is advantageous to draw the sister profession's attention to the possibility and probability of stablemen and others about horses—especially in London—contracting this fearful and loathsome malady. From what veterinary surgeons know of the communicability of glanders to man I should say he is not a very susceptible subject. Veterinary surgeons are often in a better position to trace a connection between the diseases of our patients and their human attendants than is the medical profession ; and it would well repay the latter to confer with us on these matters in cases of suspicion.

As an example of this I would like to draw your readers' attention to the case of a groom who had been, he said, "nursing a sick glandered horse for weeks, giving it—with his hands—six balls daily under a V.S.'s directions and eventually took it to the knackers to be slaughtered. The man himself was taken ill apparently with, he said, "bronchitis and pleurisy" and was ill in bed for several weeks, but so far recovered to be able to walk about again. He, however, still coughed and raised a large quantity of discharge ; he even did a little light work but soon had to lay up again. I frequently saw and conversed with this man and he frequently said to me, "Ah, master, those horses killed me, I was all right until I looked after them." and I used to impress upon him the necessity of telling his medical attendant his thoughts and surmises, but he told me when I last saw him a day or two before he died "that he had not done so" and I again pressed him to do so. I did not know his medical attendant well enough to go and tell him myself, but I have often wished I had, and that a proper post-mortem had been conducted.

There is no reason why a man should not show—as our patients often do—all the symptoms this man did and the medical attendant mistake it for the more familiar diseases of bronchitis, pleurisy, or tuberculosis.

I cannot help thinking that many of the cases so registered may be "glanders" and even the "farcy" form which appears to be the common one recognised by the medical profession may, and I have little doubt is mistaken for other forms of blood poisoning.

I am glad to see the Board of Agriculture have at last appointed a committee to investigate "glanders" and wish it every success.

GEO. A. BANHAM, F.R.C.V.S.

OBITUARY.

The death is announced of Mr. John Bromley, M.R.C.V.S., Lancaster. He was one of the most efficient veterinary surgeons of his day, and kept many fine herds right by weeding out delicate and weak animals. He was for many years Secretary of the Lancaster Agricultural Society, and at the annual meeting last week a vote of condolence with his family on their loss was unanimously passed.—*Live Stock Journal*, Feb. 15.

COMMUNICATIONS, BOOKS, AND PAPERS RECEIVED :—Major Pallin, Lieut. G. K. Walker, Messrs. G. Mayall, G. Upton, H. B. Elliott, E. Lionel Stroud, W. Awde, A. S. Hodgkins, R.Clunas, J. H. Wright, A. New, T. Le Th. Douse; J. H. S. "F.R.C.V.S.' "The Doctor Sahib."

Our Dogs, The Farriers' Journal, The Birmingham Daily Gazette.

Veterinary Societies—Addresses.

Alterations for this list must be duly notified by the Secretaries

BOMBAY V.M.A.
Pres Major Jas. Mills, M.R.C.V.S.
Vice-Pres: Vety.-Lieut. F. S. H. Baldrey, M.R.C.V.S. A.V.D.
N. D. Dhakmarvala, Esq., G.B.V.C.
S. N. R Ranina, Esq., G.B.V.C.
N. Narsingrao, Esq., G.B.V.C.
Hon. Sec. & Treas: V. E. Vakharia, Esq., G.B.V.C.

BORDER COUNTIES V.M.S.
Pres: Mr. W. C. Croudace, M.R.C.V.S., Haltwhistle
Hon. Sec. & Treas: Mr. H. Thompson, M.R.C.V.S., Aspatria
Meetings, Second Friday of Feb., June, and October

CALCUTTA V.M.A.
Pres: Mr. Greenhill, M.R.C.V.S.
Hon. Sec: Mr. T. Assheton Smith, 156 Dhurrumtollah

CENTRAL V.M.S.
Pres. Mr. Sydney H. Slocock, F.R.C.V.S., Hounslow
Hon. Sec: Mr. E. Lionel Stroud, M.R.C.V.S.,
29 Spring-st., Hyde Park, W.
Meetings, First Thursday in each month, except August and September, 10 Red Lion Square, Holborn, at 7 p.m.

CENTRAL V.A. OF IRELAND.
Pres. Mr. W. A. Byrne, M.R.C.V.S., Roscommon
Hon. Sec. & Treas: Mr. M. J. Cleary, M.R.C.V.S., Mullingar

EASTERN COUNTIES V.M.A.
Pres: Mr. Sidney Smith, M.R.C.V.S., High-st, Lowestoft
Hon. Sec.: Mr. F. B. O. Taylor, M.R.C.V.S.
Weston Longville, Norwich
Meetings, Second Tuesday, Feb. and July

GLASGOW V.M.S.
Pres. Principal McCall.
Hon. Sec. Mr. John P. Small.

VET. MED. ASSN. OF IRELAND.
Pres: Mr. M. Hedley, F.R.C.V.S.
Privy Council Office, Dublin Castle
Hon. Sec. Mr. J. McKenny, M.R.C.V.S.
116 Stephens-green-west, Dublin

LANCASHIRE V.M.A.
Pres: Mr. Jos. Abson, F.R.C.V.S., Norfolk-st, Sheffield
Hon. Sec: Mr. Harry Locke, M.R.C.V.S.
Grosvenor Street, Oxford Street., Manchester
Meetings, 1st Thursday in March, June, Sept., & Dec.

LINCOLNSHIRE V.M.S.
Pres Mr. James Smith, M.R.C.V.S., Huntingdon
Hon. Sec: Mr. E. C. Russell, M.R.C.V.S., Grantham
Meetings, Second Thursday, Feb., June and October

MIDLAND COUNTIES V.M.A.
Pres: Mr. John Blakeway, F.R.C.V.S., Birmingham
Hon. Sec: Mr. H. J. Dawes, F.R.C.V.S.,
Camden House, High St., West Bromwich
Meetings, Second Tuesday, Wednesday, Thursday, and Friday alternately in Feb., May, Aug. and Nov.

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Hon. Sec: Mr. H. S. Elphick, M.R.C.V.S.
Newgate-street, Newcastle-on-Tyne
Meetings, Third Friday, Feb., May, Aug. and Nov.

NORTH OF SCOTLAND V.M.S.
Pres: Mr. J. McBryde, M.R.C.V.S., Strichen
Hon. Sec. & Treas: Mr. Clement Baxter, M.R.C.V.S., Elgin

NORTH WALES V.M.A.
Pres: W. Wynne Williams, M.R.C.V.S., Dolgelly
Hon. Sec. O. Trevor Williams, M.R.C.V.S., Llangefni
Meetings, First Tuesday, March and September

ONTARIO V.A.
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Sec: C. H. Sweetapple, Toronto.

ROYAL COUNTIES V.M.A.
Pres: Mr. Sidney Villar, F.R.C.V.S., Greenhill, Harrow.
Hon. Sec: Mr. E. P. Owen, M.R.C.V.S., 98 High-st. Thame
Meetings, Last Friday, Feb., June and Nov.

ROYAL SCOTTISH V.S.
Pres: Mr. Reid, M.R.C.V.S., Auchtermuchty.
Hon. Sec: Mr. W. D. Fairbairn, M.R.C.V.S., Cupar, Fifeshire

ROYAL VETERINARY COLLEGE M.A.
Pres: Prof. Woodruff
Hon. Sec: Mr. F. R. Mason, M.R.C.V.S., R. V. Coll.
Assist. H.S. Mr. W. H. Chase, R.V.C., Camden Town, N.W.

SCOTTISH METROPOLITAN V.M.S.
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Hon. Sec: Mr. P. Moir, M.R.C.V.S., 9 Kilmain Terr. Edinbro

SOUTH DURHAM AND NORTH YORKSHIRE V.M.A.
Pres.: Mr. G. E. Gibson, M.R.C.V.S., Sedgefield, Ferryhill
Hon. Sec: Mr. W. Awde, F.R.C.V.S., Stockton-on-Tees.
Meetings, First Friday, Mar., June, Sept. and Dec.

SOUTHERN COUNTIES V.M.S.
Pres: Mr. H. Hall, F.R.C.V.S, Southampton
Hon. Sec: Mr. C. Pack, M.R.C.V.S., Lymington, Hants
Meetings, Last Thursday, Mar., June and Sept.

SOUTH WALES AND MONMOUTHSHIRE V.M.A.
Pres: Mr. E. Sayer, M.R.C.V.S., Newport, Mon.
Hon Sec. Mr. D. G. Davies, M.R.C.V.S., High-st, Swansea
Treas. Mr, E. Sayer, M.R.C.V.S., Newport, Mon.
Meetings First Thursday in March, and Autumn.

WESTERN COUNTIES V.M.A.
Pres: Mr. P. G. Bond, M.R.C.V.S., Plymouth
Hon. Sec: Mr. John Dunstan, M.R.C.V.S. St. Mellion, Cornwall
Meetings, Third Thursday, March, July and November

WEST OF SCOTLAND V.M.A.
Pres: Dr. James McIntosh McCall, Vety. Coll. Glasgow
Hon. Sec: & Treas: Mr. J. Bishop, M.R.C.V.S.,
754 Garscube Road, Glasgow

YORKSHIRE V.M.A
Pres Mr. Frank Somers, M.R.C.V.S. Wade Lane, Leeds
Hon. Sec; Mr. A. McCarmick, M.R.C.V.S., Kirkstall-rd, Leeds
Meetings, Last Friday in Jan., April, and October.